

Restricted time diagnoses: expertise differences among clinical pathologists

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Restricted time diagnoses: expertise differences among clinical pathologists

For the diagnostic process in clinical pathology, the first few seconds are of major importance. According to pathologists, this is the time period where an important part of the diagnosis is formed. To test this hypothesis, this experiment had pathologists of different expertise levels perform diagnoses with a time constraint (two seconds).

38 clinical pathologists of different expertise levels (13 pathologists, 12 residents, and 13 medical students; 14 males, 24 females) diagnosed 10 images of the colon. The images were stills from a digital microscope and thus two-dimensional colour pictures. Five of the images were low magnification images (approx. 3x), the other five high magnification images (20x). Two images regarded normal tissue, three adenomas, and five adenocarcinomas. Participants only saw the images for two seconds. Patient background information was given upfront, and afterwards participants were asked to diagnose the image in a standardised way (multiple choice with five options) and explain verbally. Dependent variables investigated so far are general performance (correctness of diagnosis), several basic eye movements measures, and eye movements in areas of interest.

So far, performance and eye movement data have been analyzed. Results showed a significant expertise effect on performance (between novices and intermediates/experts, not between experts and intermediates), scanpath length, and the number of fixations in diagnostically relevant areas. Also, significant effects of the magnification level and the nature of the stimulus (i.e. kind of disease) were found on a number of variables, such as number of fixations, scanpath length, and average fixation duration, indicating a bottom-up effect of the stimulus.

The verbal data will be used to refine the performance outcomes, and to investigate the differences in verbal descriptions of the visual patterns between novices, intermediates and experts.